SOCIETIES AND ACADEMIES

LONDON

Royal Society, February 9.—"Abstract of Paper on the Effect of Exercise upon the Bodily Temperature." By Dr. T. Clifford Allbutt. The object of the author in carrying out the experiments recorded in the present paper was to inquire whether the regulating power of the organism held good under great variations of muscular exertion. For this purpose he made frequent daily examinations of his own temperatures during a short walking tour in Switzerland, and found that the effect of continuous muscular exertion upon himself was to sharpen the curve of daily variation, the culmination being one or two-tenths higher than usual, and the evening fall coming on more rapidly and somewhat earlier. Charts of the daily temperatures were handed in with the paper. The author made reference also to some observations of M. Lortet, which differed from his own. These observations, which did not come into Dr. Clifford Allbutt's hands until his own experiments were partially completed, were adduced by M. Lortet to prove that the human body was very defective in regulating power under the demands of the combustion needed to supply the force expended in muscular exertion. Dr. Clifford Allbutt's results were very decidedly opposed to those of M. Lortet; for only on two occasions did he note the depressions of temperature which M. Lortet regards as constant. It would seem, however, that the body is more or less liable to such depressions when engaged in muscular exertion; but the cause of them is very obscure. Of the two low temperatures noted by the author, one occurred during a very easy ascent of lower slopes, and the second was observed during a descent. The author thinks that they may be due to some accidental deficiency in combustion, and inquires whether the capacity of the chest in different individuals may account for the varying influence of muscular effort upon them, and perhaps for the earlier or later sense of fatigue. The sphygmographic tracings added by M. Lortet to his temperature charts seemed to show a great inadequacy of circulation.—"Observations of the Eclipse at Oxford, December 22, 1870." By John Phillips, F.R.S.

Geological Society, January 25.—Mr. Joseph Prestwich, F.R.S., President, in the chair. Richard Atkinson Peacock, of St. Helier's, Jersey; Arthur W. Waters, Davos Plaz, Canton of Grisons; R. Koma, of University College, London; and Ransom Franklin Humiston, M.A., Professor of Chemistry in Cleveland University, U.S., were elected Fellows of the Society. The following communications were read: 1. "On the Physical Relations of the New Red Marl, Rhætic beds, and Lower Lias," by Prof. A. C. Ramsay, LL.D., F.R.S., F.G.S. The author commenced by stating that there is a perfect physical gradation between the New Red Marl and the Rhætic beds. He considered that the New Red Sandstone and Marl were formed in inland waters, the latter in a salt lake, and regarded the abundance of oxide of iron in them as favourable to this view. The fossil footprints occurring in them were evidence that there was no tide in the water. The author maintained that the New Red Marl is more closely related to the Rhætic, and even to the Lias, than to the Bunter; and in support of this opinion he cited both stratigraphical and palæontological evidence. He described what he regarded as the sequence of events during the accumulation of the later Triassic deposits and the passage through the Rhætic to the Lias, and intimating that the same reasoning would apply to other British strata, especially some of those coloured red by oxide of iron, including the Permian, the Old Red Sandstone, and a part of the Cambrian. Mr. Etheridge thought the question of the nature of the Rhætic beds was to a great extent palæontological. The main point in connection with them was as to how the British beds were to be connected with the Lombardic and Middle European areas. It certainly seemed probable that in this part of the world the conditions of life were different, the deposits being much less in thickness, and the fauna much diminished; and where represented at all, the shells occurred in a dwarfed and stunted form. The exact horizon and nature of the Sutton beds had still to be determined. Mr. Godwin-Austen believed that every mass of red sandstone would ultimately be referred to either a brackish or freshwater origin. A comparison of the ancient and present area of the Caspian Sea would tend to remove any doubt that might remain on the mind of geologists as to the possibility of the existence of such vast internal seas as those which had to be called in to account for these formations. He regretted that former observers had not attached more importance to the duration and extent of those freshwater conditions which were found so commonly to have prevailed between the periods of deposit of the great marine formations. There was another fact to be borne in mind, that even in existing lakes the water at the one end was sometimes completely fresh, and at the other end salt, each, of course, with a different fauna. Prof. Rupert Jones said that, although there were good grounds for the lake-theory, something might be said for shallow seas. He remarked that sulphate of lime was deposited from sea-water before salt, that oxide of iron might originate from chloride of iron diffused in water whether of lakes or seas, and that the hæmatites of Permian age were probably deposited in the sea. He considered that Foraminifera required great caution when used as criteria, as the varietal forms giving the facies were of more importance than the genera and species. The *Estheriæ* were never marine, although often occurring in plenty in temporary freshwater pools on the sea-shore. In his monograph of *Estheria* he had said much to substantiate the notion that freshwater conditions often prevailed during the formation of the Keuper. Both in the Old Red Sandstone of the Baltic provinces and in the Lettenkohle and Keuper of Germany, when *Estheria* comes in, *Lingula* dies out. The *repeated* set of formations in the Permian and the Trias precludes their contemporaneity, as supposed by Messrs. Godwin-Austen and Marcou. Mr. Bauerman marked that the Hallstatt beds which had been cited as marine contained large deposits of rock-salt. M. Marcou thought that the difficulties in regarding these beds as of freshwater origin were greater than the author supposed. The absence of fossils in gypsum, though almost universal, was not total. He had himself seen three specimens of *Trigonia* in gypsum from Stuttgart. Mr. Tate mentioned the discovery by Mr. Burton of marine fossils in the Red Marl, in one instance in combination with vegetable remains. He commented on the sharp demarcation observable in Ireland between the Rhætic beds and the marl below, whereas it was almost impossible to separate them from the Lias above. He doubted, however, whether the true relations of the Rhætic beds were to be worked out in this country. As to the fossils of the Sutton Stone, they were all purely Liassic. Mr. Burton stated that the fossils from the Red Marl came from a spot about five miles from Retford, in the direction of Gainsborough, but he had not seen them *in situ*. There are, however, no Rhætic beds within some miles. Rev. Mr. Winwood, in the absence of Mr. C. Moore, from ill health, inquired whether the author regarded the White Lias as Rhætic or Liassic. Prof. Ramsay, in reply, was quite willing to accept marine fossils as coming from the Red Marl. The fact of *Estheria*, a brackish or freshwater form, occurring in certain bands, was in favour of his views, as he considered that at intervals the freshness of the water in such a lake as he had suggested must have varied. He could not accept the probability of oxide of iron having been deposited in a large sea area to such an extent as to colour the sands. All rocks that could be proved to be of marine origin, even when they contained iron, were not stained red unless by infiltration from above. He pointed out that the old area of the Caspian was far larger than the lake in which he had suggested that the New Red Marl had been deposited. If, as was more than probable, there had been during all geological time continental areas somewhat in the same positions as those of the present day, there must have been large areas of inland drainage in which some such deposits as those in question must of necessity have been formed.—2. "Note on a large Reptilian Skull from Brooke, Isle of Wight, probably Dinosaurian, and referable to the genus *Iguanodon*." By J. W. Hulke, F.R.S., F.G.S. The author stated that the skull described by him was obtained from a Wealden deposit at Brooke, in the Isle of Wight, from which many remains of Dinosauria have been obtained. He described its characters in detail, and remarked that its most striking peculiarities were:—the completeness of the bony brain-case; the obliteration of the sutures, especially those of the basicranial axis; the massiveness of the skull; and the great downward extension of the basisphenoid, with the attendant upward slant of the lower border of the basipresphenoidal rod. The first of these characters occurs elsewhere among reptiles only in *Dicynodon*; and the first and second characters combined were regarded by the author as approximating the skull to the ornithic type. The reference of this skull to *Iguanodon* was founded chiefly on the place from which it was obtained, which has furnished abundant remains of that genus, and on the obliteration of the sutures, which the author stated to be a character of the mandibles of *Iguanodon*. Prof. Huxley congratulated the society on the progress being made in our knowledge of this interesting group of reptiles and of their ornithic affinities. Mr. Seeley remarked on the similarity of the internal cavity of the skull to that of *Ichthyosaurus*. Some of the external characteristics differed much from what he was acquainted with in other Dinosaurian skulls, which more closely resembled those of ordinary lizards. He considered that the affinities of *Dinosaurs* were in the direction of *Teleosaurus*, from which the position of what were supposed to be the optic nerves in this skull materially differed. On the whole, he was not at once prepared to accept this skull as that of an Iguanodon. Mr. Hulke briefly replied, and observed that he had limited his speculations to those which legitimately arose from the facts before him. The following specimens were exhibited to the meeting :—Specimens from the Keuper Marls and Rhætic beds near Gainsborough; exhibited by Mr. F. M. Burton, F.G.S. Examples of the borings of two species of *Pholas;* exhibited by Mr. E. Charlesworth, F.G.S.

Zoological Society, February 7.—Mr. G. R. Waterhouse, Vice-President, in the chair.—The Secretary read a report on the additions to the Society's Menagerie during the month of January, amongst which were particularly mentioned a specimen of the kakapo, or night-parrot of New Zealand (*Strigops habroptilus*).—Mr. J. E. Harting exhibited and made remarks on a fine specimen of the red-breasted goose (*Anser ruficollis*) lately killed in England.—Mr. H. E. Dresser exhibited some specimens of rare European birds'-eggs, amongst which were those of *Micronisus brevipes* and *Reguloides superciliosus*.—Mr. E. Ward exhibited a skin of a white variety of the tiger (*Felis tigris*), obtained from an animal killed in the Mirzapore district.—Mr. W. B. Tegetmeier exhibited a specimen of an eel, believed to be new to the fauna of Great Britain. It had been obtained from fresh-water in the Scilly Islands, and was referred by Dr. Günther to a variety of *Anguilla vulgaris*, called *A. cuvieri* by Kaup.—A communication was read from Dr. Robert O. Cunningham, containing notes on some distinctive points in the osteology of *Rhea americana* and *Rhea darwinii*.—Mr. J. E. Harting read a paper on the Arctic collection of birds presented by Mr. John Barrow to the University Museum, Oxford, and drew attention to some interesting facts in connection with the geographical distribution of birds in northern latitudes.—A communication was read from Professor Carl J. Sundevall, containing an account of the birds obtained in the Galapagos Islands, during the voyage of the Royal Swedish frigate *Eugenia*.—Mr. R. B. Sharpe read a paper on the birds of Angola, founded on collections made in that country by Mr. J. J. Monteiro and Mr. Charles Hamilton, being his third communication on this subject.—Mr. J. Verreaux pointed out the characters of a new species of *Promerops* from Natal, which he proposed to call *Promerops gurneyi*.—Dr. J. E. Gray communicated a description of *Platasterias*, a new genus of *Astropectinidæ* from Mexico.—A communication was read from Mr. D. G. Elliot, containing the description of a new species of pheasant of the genus *Euplocamus* from Burmah, proposed to be called *Euplocamus andersonii*.—Dr. John Anderson pointed out the characters of three new species of squirrels (*Sciurus*) recently obtained by him during the Yunan Expedition. Dr. Anderson also gave an account of a new Cetacean which he had lately discovered in the Upper Irrawaddi, and which he proposed to call *Orcela fluminallis*. A third communication from Dr. Anderson contained a note on the occurence of the remarkable parasitic Crustacean *Saccalina* in the Bay of Bengal. The species, which had been found on the common swimming crab of that district (*Thalamita crenata*) did not appear to differ from that which is found on *Carcinus mænas* on the shores of Great Britain.

Royal Institution, February 6.—Monthly General Meeting. Sir Henry Holland, Bart., F.R.S., President, in the chair. Henry Edward Colvile, Esq.; John H. Dallmeyer, Esq.; Duncan Davidson, Esq.; Warren William De la Rue, Esq.; James N. Douglass, Esq.; Mrs. Gibbs; Abraham Goodall, Esq., F.R.C.S.; Alexander Macfarlan, Esq.; Robert Turtle Pigott, Esq., F.R.G.S.; Robert Sabine, Esq.; Charles Southwell, Esq.; Henry Stilwell, Esq.; Richard Valpy, Esq.; Mrs. Jacob Waley, were elected members of the Royal Institution. The presents received since the last meeting were laid on the table, and the thanks of the members returned for the same.

Entomological Society, February 6.—Mr. A. R. Wallace, President, in the chair.—Pastor Kawall, of Pussen, Kurland, was elected a corresponding member.—Mr. Bond exhibited *Pachinobia alpina*, *Gelacha borcella*, varieties of *Thera juniperata*, and *Larentia cæsiata*, and portions of web of *Hyponomenta padi* over a yard long, all from Perthshire; also photographs of eggs of bird parasites, taken from slides prepared by Mr. Norman. He likewise exhibited a curious instance of monstrosity in *Vanessa Atalanta*, the butterfly still retaining the larval head. —The Rev. H. S. Gorham exhibited *Oxytelus fulvipes* of Erichson, a new British beetle.—Mr. Müller exhibited specimens of oak-galls from Tangiers, collected by Mr. Blackmore.—Prof. Westwood exhibited a minute species of *Corixa* from India, destructive there to the eggs of the most valuable freshwater fish; also drawings of a species of *Coccidæ* injurious to the leaves of an exotic *Cypripedium*. The male shield consisted of a small disc, with six raised radiating lines produced into spines. —Mr. Butler read a descriptions of a new genus, and of seven new species of *Pierinæ*.

MANCHESTER

Literary and Philosophical Society, January 24. — Mr. E. W. Binney, president, in the chair.—Mr. Brothers exhibited a drawing from the fine photograph of the solar Corona, taken by him at Syracuse, during the late total eclipse of the sun.—Dr. Joule, F.R.S., read the following letter, dated January 21, 1871, which he had received from Mr. William H. Johnson, of Bowdon :—" Since the last meeting of the Philosophical Society I have made some further experiments on the 'Effect of cold on the strength of iron.' In these I have maintained a nearly fixed temperature, and thus avoided to a great extent the error occasioned by the rise in temperature, consequent on sudden torsion. January 11. A piece of a charcoal wire rod, ·237in. diameter, gave the following results :—

	1st.	2nd.	3rd.
At about 40° F. . . .	20 twists .	. 19 twists .	. 17 twists.
Adjacent 6″ at temperature of melting zinc .	10 twists .	. 9 twists .	. 7½ twists.

	4th.	5th.
Twisted very slowly, surrounded by salt and snow	19¼ twists.	. 16 twists.
Adjacent 6″ at about 40° F	15 twists .	.

The twisting under salt and snow was performed so slowly, each experiment lasting a quarter of an hour or more, that the temperature cannot have been affected by the torsion. The same care was taken at the temperature of 40° F. The great diminution of strength at the melting point of zinc is remarkable. I take the liberty of communicating these results to you, as unfortunately I shall be away at the next meeting, and thus shall not have an opportunity of seeing you." Mr. Brockbank remarked that these experiments did not affect the conclusions stated in his paper, read at the last meeting. He believed that the strength of iron under torsion was most affected by the heat developed by the twisting, and that the cooling mixture employed by Mr. Johnson would have the effect of making the wire stand a greater number of twists by counteracting the excessive heat produced by the torsion. Mr. Brockbank exhibited a drawing of the machine used by him in his experiments on the strength of cast iron at different temperatures.—"Experiments on the Oxidation of Iron," by Prof. E. Crace Calvert, Ph.D., F.R.S., &c. Some two years since Sir Charles Fox inquired of me if I could give him the exact composition of iron rust, viz., the oxidation found on the surface of metallic iron. I replied that it was admitted by all chemists to be the hydrate of the sesquioxide of iron, containing a trace of ammonia; to this he answered that he had read several books on the subject, in which the statements referring to it differed, and from recent observations he had made, he doubted the correctness of the acknowledged composition of iron rust. He further stated that if he took a bar of rusted wrought iron, and put it in violent vibrations, by applying at one end the fall of a hammer, scales would be separated which did not appear to him to be the substance I had described. This conversation induced me to commence a series of experiments which I shall now detail. I first carefully analysed some specimens of iron rust, which were procured, as far as possible, from any source of contamination. Thus one of these samples was supplied to me by Sir Charles Fox, as taken from the outside of Conway Bridge, the other secured by myself at Llangollen, North Wales. These specimens gave the following results when submitted to analysis :

	Conway Bridge.	Llangollen.
Sesquioxide of iron . . .	93·094 . .	92·900
Protoxide of Iron . . .	5·810 . .	6·177
Carbonate of iron . . .	0·900 . .	0·617
Silica	0·196 . .	0·121
Ammonia	Trace	Trace
Carbonate of lime . . .	—— . .	0·295

These results clearly show the correctness of Sir Charles Fox's foresight, that the composition of the rust of iron is far more complicated than is stated in our text-books. Therefore the question may be asked, Is the oxidation of iron due to the direct action of the oxygen of the atmosphere, or to the decomposition of its aqueous vapour; or does the very small quantity of carbonic acid which it contains determine or intensify the oxidation of metallic iron? To reply to it I have made a long series of experiments, extending over two years, and which I hope will throw some light on this very important question. Perfectly cleaned blades of steel and iron, having a gutta percha mass at one end, were introduced in tubes which were placed over a mercury trough, and by a current of pure oxygen conducted to the top of the experimental tube; the atmosphere was displaced, and it was then easy to introduce into these tubes traces of moisture, carbonic acid, and ammonia. After a period of four months, the blades of iron so exposed gave the following results:—

Dry Oxygen	No oxidation.
Damp ,, ...	In three experiments, only one blade slightly oxidised.
Dry Carbonic Acid	No oxidation.
Damp ,, ...	Slight appearance of a white precipitate of the iron, found to be carbonate of iron. Two only out of six experiments did not give these results.
Dry carbonic acid and oxygen . .	No oxidation.
Damp oxygen and carbonic acid	Oxidation most rapid, a few hours being sufficient. The blade assumed a dark green colour, which then turned brown ochre.
Dry oxygen and ammonia . .	No oxidation.
Damp ,, ,, . . .	No oxidation.

The above results prove that under the conditions described, pure and dry oxygen does not determine the oxidation of iron, that moist oxygen has only feeble action; dry or moist pure carbonic acid has no action, but that moist oxygen containing traces of carbonic acid acts most rapidly on iron, giving rise to protoxide of iron, then to carbonate of the same oxide, and lastly to a mixture of saline oxide and hydrate of the sesquioxide of iron. These facts tend to show that carbonic acid is the agent which determines the oxidation of iron, and justify me in assuming that it is the presence of carbonic acid in the atmosphere, and not its oxygen or its aqueous vapour, which determines the oxidation of iron in common air. Although this statement may be objected to at first sight, on the ground of the small amount of carbonic acid gas existing in the atmosphere, still we must bear in mind that a piece of iron, when exposed to atmospheric influences, comes in contact with large quantities of carbonic acid during twenty-four hours. These results appeared to me so interesting that I decided to institute several series of experiments. When perfectly clean blades of the best quality of commercial iron are placed in ordinary Manchester water, they rust with great facility, but if the water is previously well boiled and deprived of oxygen and carbonic acid, they will not rust for several weeks. Again, if a blade of the same metal is half immersed in a bottle containing equal volumes of pure distilled water and oxygen, that portion dipping in the water becomes rapidly covered with the hydrate of the peroxide of iron, whilst the upper part of the blade remains for weeks unoxidised; but if a blade be placed in a mixture of carbonic acid and oxygen, a very different chemical action ensues, as not only that portion of the blade dipping in the water is rapidly attacked, but the upper part of it immediately shows the result of chemical action, and also the subsequent chemical reactions are greatly modified by the presence of the carbonic acid. For in this case that portion of the blade is only covered with a film of carbon, together with a dark deposit composed of carbonate of the protoxide and hydrate of the sesquioxide. The fluid, instead of remaining clear, becomes turbid. These series of experiments substantiate the interesting fact observed—that carbonic acid *promotes* oxidation. A long series of experiments were also made to try and throw some light on the curious fact, first published by Berzelius, subsequently studied by other chemists, and well known to soap and alkali manufacturers, namely, that caustic alkalies prevent the oxidation of iron; my researches can be resumed as follows:—(1) that the carbonates and bicarbonates of the alkalies possess the same property as their hydrates; and (2) that if an iron blade is half immersed in a solution of the above-mentioned carbonates, they exert such a preservative influence on that portion of the bar which is exposed to an atmosphere of common air (oxygen and carbonic acid), that it does not oxidise even after a period of two years. Similar results were obtained with sea water, to which had been added carbonates of potash and soda.

Microscopical and Natural History Section, January 9.—Mr. J. Baxendell, President of the Section, in the chair. "On *Carex flava* L., and its allies, of the Manchester Flora," by Charles Bailey. The prevailing form in the district, and one very common to the south of Manchester, is the *Carex lepidocarpa* Tausch.; this is the *C. Œderi* Sm., and of Grindon's Manchester Flora, and the *C. flava* var. β of Buxton's Guide. The true *C. flava* (α *genuina* E.B.), as stated long ago by Mr. Buxton, is nowhere met with in the district. Specimens of *C. Œderi* Ehrh. from Mere Mere, the locality mentioned in Buxton's Botanical Guide, were recently exhibited at a meeting of the Society, and the sandhills at Southport are, so far as I know, the only locality in the neighbourhood for this species.

TAUNTON

Somersetshire Natural History Society, February 6.—The following notice was read by Mr. Cecil Smith.—The Great Bustard has now so long been considered extinct in England, that we may look upon it as interesting in an archæological as well as in a natural history point of view. This bird, one of a flock of eight that made their appearance on the last day of the old year at Braunton, near Barnstaple, in North Devon, is probably a young hen bird of the first, certainly not more than the second, year. On looking at this bird, perhaps, one of the first things that strikes one is the shape of the foot, the three toes in front and no hind toe; and this brings me at once to the subject of classification or order. Yarrell, whose system is best known and most generally adopted, has made the bustards a group of the Rasoreal order, where I cannot help thinking they are not a little out of place, there being no very nearly allied group in that order. I am much more inclined to agree with Baron Cuvier and some of the other older systematic authors who placed the bustards amongst the Grallatores or Stilted birds, where they seem naturally to fall into place next to their near relations, the Plovers; the absence of the hind toe, a conspicuous mark of the true Plover, would at once suggest this position. The form of the sternum or breast bone also points to a relationship with the plovers rather than with any of the Rasores. Another point which can scarcely be passed over in silence in a paper on the Great Bustard is the gulor pouch. It seems surprising that the use, and even the existence, of this pouch has so long been a matter of doubt and perplexity to naturalists. Much light has, however, lately been thrown on the subject by Prof. Newton, Mr. Bartlett, and Dr. Murie, and it seems finally to have been set at rest by Dr. Cullen, the result of whose examinations has been reported in the *Ibis* for 1865. He readily found the opening into the pouch under the tongue, and describes it as large enough to admit the little finger; the pouch itself, he says, extended as far down as the furcular bone, and was a separate and distinct, though delicate, bladder. He then describes the performances of the male bustard in the breeding season, at which time, he says, it makes a peculiar sound, resembling the word "ook," and he strongly favours the idea that the pouch is merely an organ of sound, and that it is acted upon by the muscular tissue covering it; in fact, that it is a sort of bird bag-pipe, and seems not to produce much more melodious sounds. Although the Great Bustard was formerly resident in England throughout the year, it is generally a migratory bird, its migratory propensities being much developed by stress of weather and scarcity of food; whether either of these causes or the war in France, has been the reason for the present unusual migration to England is perhaps difficult to say; myself, I should be inclined to think bad weather and the consequent loss of food the more probable cause. The gradual extinction of the Great Bustard in England has been the general theme of most of onr writers on ornithological subjects from the time of Bewick and Montagu to the present time of Mr. Stevenson, who in his still unfinished work on the "Birds of Norfolk," gives a most interesting account of the decline and fall of the Great Bustard in that county. In Devonshire, where this bird was killed, the Great Bustard, although never resident, seems from time to time to have paid occasional migratory visits. Montagu mentions the occurrence of one near Plymouth in the year 1798, two more in the next year, and one in 1864. Another Devonshire specimen occurred, after a long interval, on the 31st December, 1851, near Clovelly, and was recorded by Mr. Gatscombe, in the *Naturalist*. The 31st December seems to have been a favourite day with the Great Bustard in North Devon, for the flock, of which this present specimen was one, appeared on Braunton Burrows, near Barnstaple, on that day last year; the flock consisted of eight, and was first observed in a field near Croyde, where two were killed and one wounded. The remainder of the flock then alighted. Some boys, who were sliding close to Braunton, pelted them with stones, upon which the birds flew off, and were not heard of for some days; subsequently, I heard they were seen at Halsworthy, in the west of Devon, not very far from the border of Cornwall, but none were obtained there. In Devon they were considered to be wild turkeys, and the following paragraph appeared in the *North Devon Journal*:—"Wild fowl.—During Christmas week a flock of eight wild turkeys visited this parish, and alighted in a field at Croyde. They were seen by Mr. William Nuich, who followed and shot one which weighed 9lb., and was much admired. The others took their flight to the west, and have not since made their appearance." This migration of the Great Bustards was not confined to Devon alone, for in the February number of the *Zoologist*, specimens are reported from Middlesex, Northumberland, Wiltshire, and Somersetshire. The Somersetshire specimen is of course the most interesting to us: it was seen by Mr. Harting on the 27th of September, when journeying by rail from Bishops Lydiard to Wells in the low marsh country near Shapwick. His attention was first attracted by seeing a bird crouch at the approach of the train. He kept his eyes on the bird until the distance was considerably decreased, when the bird jumped up and ran swiftly away, exhibiting to his astonishment the long legs and white flanks of a bustard. Mr. Harting subsequently published an account of his interview with this bustard in the *Field*. He seems to have no doubt himself that the bird he saw was a bustard, and as he seems to have had sufficient opportunity to identify it, we must therefore take it that this Shapwick bustard was the pioneer of the December migrants, and that we have to thank Mr. Harting for this important addition to our Somersetshire avi-fauna. Although this migration has refreshed our memory of the Great Bustard for a time, I am afraid we must in England look upon it as a bird of the past, certainly as a resident, one or two migratory appearances like the present may no doubt from time to time stir up the ornithological world, and cause a temporary excitement; but that a bird of such considerable size and conspicuous plumage should for any time continue to exist in such a highly cultivated and thickly inhabited country as England seems impossible. Should it do so in any considerable numbers we should very soon have an outcry from some of our farmers, as it is addicted to feeding upon corn, both when green and ripe, and is moreover especially fond of turnip greens. No doubt in more ways than one the present system of high farming and the amount of machinery used is most fatal to the Great Bustard as a resident, and we must soon look upon him as having his memory perpetuated like the Druid,* only as the sign of a public house, and being classed by some future Mr. Weller with a "griffin, a unicorn, or a King's Arms, as is well known to be a collection of fabulous animals."

PHILADELPHIA

Academy of Natural Sciences, Nov. 8.—Mr. Thomas Meehan referred to a potato presented to the Academy some months ago by Mr. Henszey, a member, which had the appearance of one potato growing out of the centre of another. The opinion of all who saw it was that it was really a case of this kind. It had been handed to him by the curators, and on dissection, though no exact place of origin could be traced, there seemed nothing to indicate any other theory of origin than that one potato had really grown out of the centre of the other. But there were serious physiological reasons in the way of such a theory. A potato tuber is really but a thickened axis, in which the greater part of the interior structure would be incapable of developing a bud which would produce a tuber such as this one had done. The origin of a new tuber from an old one would be nearer the old one's surface. He had been looking for some further explanatory facts, and believed he had them here this evening, in the potato tubers he now handed to the members. They were about the size of hen's eggs, and were pierced in every direction by stolons of the common couch grass, *Triticum repens.* They had gone completely through, as if they were so much wire, and in one instance two tubers had become strung together by the same stolon, as if they were two beads on a string. One would suppose that the apex of the stolon, when it came in contact with the hard surface of the tuber, would turn aside and rather follow the softer line of the earth; but there was no appearance of any inclination to depart from their direct course. They had gone apparently straight through. He had no doubt the potato before referred to was a similar case, a potato stolon had penetrated another potato, and instead of going through as these grass spears had done, terminated in the centre, and formed the new potato there. It was worthy of thought whether so much attention had been given to this direct force in plants as the subject deserved. It was well known that a mushroom would lift a paving-stone many times its own weight, rather than turn over and grow sideways, which it would appear so much easier for it to do; and tree roots growing against walls would throw immensely strong ones over, though one would think the pressure against the softer soil would give room for their development, without the necessity of their expending so much force against the wall.

November 15.—Dr. Ruschenberger, President, in the chair. Prof. Leidy directed attention to some fossil bones which had been submitted to his examination by Prof. J. D. Whitney. According to the accompanying label, they were found under Table Mountain, near Shaw Flat, Tuolumne Co., California. The bones are friable, and have attached portions of a light ash coloured gravel. Several masses of the latter substance accompanying the bones, contain casts of some fruit. Prof. Leidy further directed attention to a fossil fragment of the lower part of a small pachyderm, which Prof. Hayden had obtained from Henry's Fork of Green River, Wyoming. The specimen contained the fourth, the sixth, and the seventh molars. The teeth resemble in form and constitution those of the *Lophiotherium cervulum*, a small pachyderm, described by Prof. Gervais, from an Eocene formation of France. The crowns of the fourth to the sixth molars have four lobes; that of the seventh molar has an additional lobe. The crescentic summit of the postero-external lobe joins, by its anterior horn, the antero-internal lobe. A proportionately well developed basal ridge embraces the crowns, except internally, where it is entirely absent. The series of the back four molars occupies a space of 16 lines. The last molar is 5½ lines fore and aft. The base of the jaw is nearly straight the length of the fragment, which is an inch and a half. The depth of the jaw below the fifth molar is about an inch. The species may be named *Lophiotherium sylvaticum.*

November 29.—Dr. Ruschenberger, President, in the chair. On "Bud Varieties," by Thomas Meehan.—A few years ago Mr. Isaac Burk called my attention to a form of *Rubus villosus*, L., in which the terminal leaflet was very large, cordate, and on very long petioles. It is a very striking variety, the leaflets appearing at first glance like large linden leaves. On the idea that varieties originated from one common centre, it is not easy to account for the existence of the same forms so many miles apart, as we find in the above, except by the accidental carrying of seeds. But I have reason to believe that seeds of *Rubus* rarely germinate in a wild state. In experiments which I have made in raising the seeds artificially, none of the seedlings come exactly like the parent. There is a certain general resemblance, but some distinction, more or less, can be traced in each individual. But, in native places, one exact form will be found to occupy extensive tracts. Sometimes several forms will be together, but only a very few. If the seeds made plants readily, there would be innumerable forms, instead of the very few we see. I found, in my experiments, that it took a long time for a blackberry seed to germinate; sometimes a whole year. Such seedlings have a poor chance to vegetate in a state of nature. Other more rapidly-growing vegetation would crowd it out. The only distributing agency I can think of is that of birds. But I find no birds eat blackberry seeds; and, if they did, when we consider that of the millions of seeds which fall about the place of their origin, few, if any, grow; the chance of those growing which birds may carry, even if there be some to eat them, which I have failed to find, is extremely small. Hence, we find great difficulty in believing that identical forms of *Rubus*, widely separated, can have originated from a common centre. It is well-known that fruits, after being grown for some time in one locality, will change their characters to such an extent that a person acquainted with one will fail to recognise it elsewhere, and all this without the intervention of any seminal power. Thus, the nectarine is believed to be a bud evolution from the peach; the Penn apple is a similar creation from Baldwin, and the Reading from the common Isabella grape. Though apparently originating in this way from external or local causes, the characters peculiar in this change are retained when, by grafts or cuttings, the plants are removed to other localities. I have here, however, and exhibit with this paper, evidence of bud variation, in which there is no possibility of hybridism,—a root of the common sweet potato, *Convolvulus batatas*, in which some of the tubers are of the red Bermuda, and the others of the white Brazilian variety. The sweet potato never flowers in this part of the country, so that seminal power could have had no influence whatever on the phenomenon. Even in the south, and I believe elsewhere, where this plant is cultivated for its roots, it rarely flowers, and I think there is little doubt but that the whole ten or twelve varieties under culture have originated without seed, and in the way we see them here. The points I wish to make in this paper are :—1st. That identical varieties sometimes appear in localities unfavourable to the idea of a common centre of origin. 2nd. Varieties have originated in which probably no hybridism or any seminal agency operated. 3rd. Varieties have certainly originated in the sweet potato by evolution, without seminal agency, and that the same variety in this way has appeared in widely-separated districts. 4th. As the discoveries of Darwin have shown, in many cases, varieties to be the parents of species, species may originate in widely-separated localities by bud variation.—"A Sketch of the Classification of the American Anserinæ," by B. H. Bannister. The following remarks are based upon an examination of the specimens of American geese in the collection of the Smithsonian Institution. The subfamily Anserinæ by many recent authors is made to include the genera *Dendrocygna* and *Chenalopex*, and doubtlessly correctly. In the present paper, however, we shall not consider these genera, leaving them provisionally out of the sub-family ; if included, they would form at least one well-marked section, following those we are about to describe. The distinguishing characters of the Anserinæ, as thus limited to the true geese, are, the lengthened tarsus, covered with hexagonal or subquadrate scales ; the neck more elongated than in the ducks and less so than in the swans ; the short, high bill gradually narrowing toward the tip, which is altogether composed of the large recurved nail ; together with the more or less terrestrial habit of life, and the usually similar plumage of the two sexes. The geese of the North American continent have been long known, and being for the most part closely allied to, and in many cases identical with, well known European forms, they fall readily into the systematic subdivisions based upon the latter. Another basis of division of the American Anserinæ is found in the presence, in two species—one North American and the other a Southern form—of deep rough superorbital depressions and reversed relative proportions of the tarsus and middle toe, together with an exclusively sea-coast habitat, and a carnivorous diet, corresponding in some of these respects to the Oidemiæ and Somateriæ amongst the ducks. These latter characters we have taken as the basis of the two sections into which we divide the subfamily, as at present considered, since they correspond with equivalent characters in one of the subdivisions of the Fuligulinæ. The presence of the deep superorbital depressions is a very general character amongst the carnivorous Natatores, though not universal.

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* The Druid and the Bustard are both the signs of public-houses on Salisbury Plain.

BOOKS RECEIVED

English.—The Year-Book of Facts for 1871 : J. Timbs (Lockwood and Co.).—A Treatise on the Action of Vis Inertiæ in the Ocean : W. L. Jordon (Longmans and Co.).

Foreign.—(Through Williams and Norgate)—1er Nachtrag zum Lehrbuche der Aufbereitskund : P. R. von Rittinger.—Biblioteca Malacologica, II., Ipsa Cheireghinii Conchylia di Spiridion Brusina.—Populäre wissenchaftliche Vorträge : H. Helmholtz.

PAMPHLETS RECEIVED

English —Quarterly Weather Report of the Meteorological Office, July-October 1869.—On the Relations between Chemical Change, Heat, and Force : the Rev. H. Highton.—On Ocean Currents : James Croll.—On the Cause of the Motion of Glaciers : James Croll.—Letter to the Right Hon Col. Wilson-Patten on the Future Establishment and Organisation of our Land Forces : Lieut.-General Sir Percy Douglas, Bart.—Report of the Cheltenham College Natural History Society for the year 1870.—Statistical Review of Ten Years of Disease in Manchester and Salford : Dr. A. Ransome.—Double Spectra : W. Marshall Watts.—On the Spectra of Carbon : W. Marshall Watts.—On the Reason why the Difference of Reading between a Thermometer exposed to Direct Sunshine and one Shaded Diminishes as we Ascend in the Atmosphere : James Croll.—An Address read at the Anniversary Meeting of the Entomological Society of London, January 23, 1871 : Alfred R. Wallace.—On the Chemical Composition and Microscopic Constitution of certain Cornish Rocks : J. A. Phillips.—Proceedings of the Somersetshire Archæological and Natural History Society for 1868-69.

American and Colonial.—Report of the Present Condition of the Geological Survey of Victoria.—Reports of the Mining Surveyors and Registrars (Victoria) for the Quarter ending September 39, 1870.—Abstracts of English and Colonial Patents and Specifications relating to the Preservation of Food, &c. : W. H. Archer (Melbourne).—Patents and Patentees (Victoria), 1814-1865 ; Index to ditto for 1868 and 1869 ; Abstracts of Specifications of Patents applied for from 1854 to 1866, Ac-Bu (Victoria) : W. H. Archer.—Descriptions of new Fossil Shells of the Upper Amazon : T A. Conrad (from the *American Journal of Conchology*).—Report of Committee on New Remedies to the Muskingum County, Ohio, Medical Society for October, 1870 (Buffalo).

Foreign.—Die Geschichte der Forschungen über die Phosphorite des mittlern Russlands von W. v. Gutzeit (Riga).—Rendiconti del reale istituto lombardo, Ser. ii. vol. 3, fasc 19, 20, and vol. 4, fasc. 1.—Correspondenzblatt der Naturforscher-vereins zu Riga.

DIARY

THURSDAY, February 16.

Royal Society, at 8.30.—On some of the more important Physiological Changes induced in the Human Economy by Change of Climate, as from Temperate to Tropical, and the Reverse (concluded) : Dr. Rattray, R.N.—On a Registering Spectroscope : Dr Huggins, F.R.S.

Society of Antiquaries, at 8.30.—On the Topography of Jerusalem, with special reference to the results obtained by the Palestine Excavation Fund and the Site of the Temple of Antonia and of the Acra : Thomas Lewin, M.A., F.S.A.

Linnean Society, at 8.—On Tremellineous Fungi and their Analogues : L. R. and C. Tulasne.—Bryological Remarks : S. O. Lindberg, M.D.

Chemical Society, at 8.

Royal Institution, at 3 —Davy's Discoveries : Dr. Odling.

FRIDAY, February 17.

Royal Institution, at 9.—On the Wolf-Rock Lighthouse : James N. Douglass.

Geological Society, at 1.—Anniversary Meeting.

Royal College of Surgeons, at 4.—On the Teeth of Mammalia : Prof. Flower.

SATURDAY, February 18.

Royal Institution, at 3.—Socrates : Prof. Jowett.

SUNDAY, February 19.

Sunday Lecture Society, at 3.30.—On the Religion of Health : Dr. Elizabeth Blackwell.

MONDAY, February 20.

Entomological Society, at 7.—On the Dispersal of Non-migratory Ins by Atmospheric Agencies : Mr. Müller.

Victoria Institute, at 8.—Phyllotaxis ; or the Arrangement of Leaves according to Mathematical Law : Prof. Henslow.

Royal College of Surgeons—On the Teeth of Mammalia : Prof. Flower.

London Institution, at 4.—On the First Principles of Biology : Prof. Huxley. (Educational Course.)

Royal United Service Institution, at 8.30.—On the Turret Ships now building for Her Majesty's Navy : E. J. Reed, C.B.

TUESDAY, February 21.

Zoological Society, at 9.—Note on the *Tænia* from the Rhinoceros : Dr. W. Peters, F.M.Z.S.—Remarks on certain species of Abyssinian Birds : J. H. Gurney.—On certain Indian Reptiles : Dr. J. Anderson.

Statistical Society, at 7.45.—On Currency and Pauperism : Mr. Ernest Seyd.

Royal Institution, at 3.—Nutrition of Animals : Dr. Foster.

WEDNESDAY, February 22.

Society of Arts, at 8.—On Water Meters : F. E. Bodkin.

Geological Society, at 8.

Royal College of Surgeons—On the Teeth of Mammalia : Prof. Flower.

Royal United Service Institution, at 8.30.—The Organisation of our Military Forces : Lieut.-Colonel Arthur Leahy, R.E. (Adjourned Discussion.)

THURSDAY, February 23.

Royal Society, at 8.30.

Society of Antiquaries, at 8.30.

Royal Institution, at 3.—Davy's Discoveries : Dr. Odling.

London Institution, at 7.30.—On the Action, Nature, and Detection of Poisons : F. S. Barff, M.A., F.C.S.

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